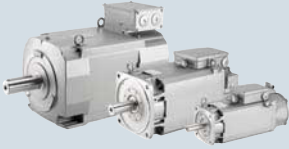
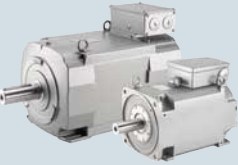


## SIMOTICS main motors

### Overview

| Motor type                                                                                                                                    | Features                                                                                                                     | Degree of protection | Cooling method     |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|
| <b>SIMOTICS M-1PH8 asynchronous motor</b><br>                | Three-phase squirrel-cage motor without housing<br>Compact unit with high power density                                      | IP55                 | Forced ventilation |
|                                                                                                                                               |                                                                                                                              | IP23                 | Forced ventilation |
|                                                                                                                                               |                                                                                                                              | IP55/IP65            | Water cooling      |
| <b>SIMOTICS M-1PH8 synchronous motor</b><br>                 | Permanent-magnet synchronous motor<br>Outstanding performance capabilities<br>Compact unit with extremely high power density | IP55                 | Forced ventilation |
|                                                                                                                                               |                                                                                                                              | IP55/IP65            | Water cooling      |
| <b>SIMOTICS M-1FE1/1FE2 synchronous built-in motors</b><br> | Synchronous built-in motors<br>Permanent-magnet                                                                              | IP00                 | Water cooling      |

#### SIMOTICS M main motors

The potential applications for SIMOTICS M-1PH8/M-1FE1/M-1FE2 motors are extremely versatile.

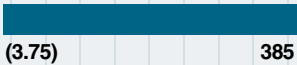
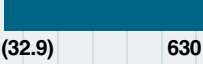
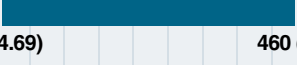
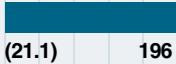
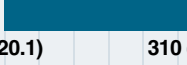
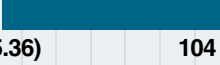
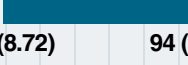
In machine tools, they are usually designated and used as main spindle motors.

In production machines, such as printing, packaging, and reforming machines, they are used as high-output main motors.

The selection and ordering data for the SINAMICS S120 Motor Modules are based on the booksize format by way of example. Blocksize and chassis formats are also possible. The SIZER for Siemens Drives engineering tool is available for detailed configuration

# SIMOTICS main motors

## Overview

| Shaft height                                                                               | Rated power $P_{\text{rated}}$ for duty type S1<br>kW (hp)                                                 | Rated torque<br>$M_{\text{rated}}$                     | Page |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------|
| SH 80/SH 100/SH 132/SH 160/<br>SH 180/SH 225/SH 280                                        | <br>2.8 (3.75) 385 (516)  | 13 ... 2475 Nm<br>(9.59 ... 1825 lb <sub>f</sub> -ft)  | 9/8  |
| SH 180/SH 225/SH 280                                                                       | <br>24.5 (32.9) 630 (845) | 317 ... 3710 Nm<br>(234 ... 2736 lb <sub>f</sub> -ft)  | 9/26 |
| SH 80/SH 100/SH 132/SH 160/<br>SH 180/SH 225/SH 280                                        | <br>3.5 (4.69) 460 (617)  | 20 ... 2610 Nm<br>(14.8 ... 1925 lb <sub>f</sub> -ft)  | 9/36 |
| SH 132/SH 160/SH 180/SH 225                                                                | <br>15.7 (21.1) 196 (263) | 94 ... 1091 Nm<br>(69.3 ... 805 lb <sub>f</sub> -ft)   | 9/52 |
| SH 132/SH 160/SH 180/SH 225                                                                | <br>15 (20.1) 310 (416)   | 107 ... 1650 Nm<br>(78.9 ... 1217 lb <sub>f</sub> -ft) | 9/58 |
| Outer diameter<br>(cooling jacket)<br>High Torque series<br>95/115/130/190/<br>205/250/310 | <br>4 (5.36) 104 (139)    | 4.5 ... 820 Nm<br>(3.32 ... 605 lb <sub>f</sub> -ft)   | 9/90 |
| High Speed series<br>120/155/180/205/<br>230/270                                           | <br>6.5 (8.72) 94 (126)  | 5 ... 300 Nm<br>(3.69 ... 221 lb <sub>f</sub> -ft)     | 9/94 |
| High Torque series<br>180                                                                  | <br>34 (45.6) 159 (213) | 640 ... 1530 Nm<br>(472 ... 1128 lb <sub>f</sub> -ft)  | 9/98 |

## SIMOTICS main motors

SIMOTICS M asynchronous and synchronous motors for SINAMICS S120

### SIMOTICS M-1PH8 main motors

#### Overview



SIMOTICS M-1PH8 motors, forced ventilation, shaft heights 80 to 160

The SIMOTICS M-1PH8 series is the latest motor generation for universal use with Motion Control applications. The wide power range is aimed at use as a central machine drive (as what is known as a "main motor") for various applications. The motors are available as an asynchronous variant as well as a compact synchronous variant with either forced ventilation or water cooling, based on a flexible building block principle. The flexible configuration – such as storage or electrical connection technology – allows you to adapt the motors to the requirements of almost any industrial application.

**Main drive with 1PH8 = high power +  
high dynamic response +  
high accuracy**



SIMOTICS M-1PH8 motors, water cooling, shaft heights 80 to 160



SIMOTICS M-1PH8 motors, water cooling, shaft heights 180 to 280

When developing the SIMOTICS M-1PH8 motor series, we placed special emphasis on making them perfectly compatible with the SINAMICS S120 drive system. For example, the specially harmonized power components, electronic rating plates, and the ability to integrate the motors via the DRIVE-CLiQ system interface ensure quick and easy commissioning as well as problem-free operation. What's more, thanks to the harmonization of the system, they are capable of handling extreme duty cycles, short rise times, and are exceptionally precise in terms of speed, torque, and positioning.

**Benefits**

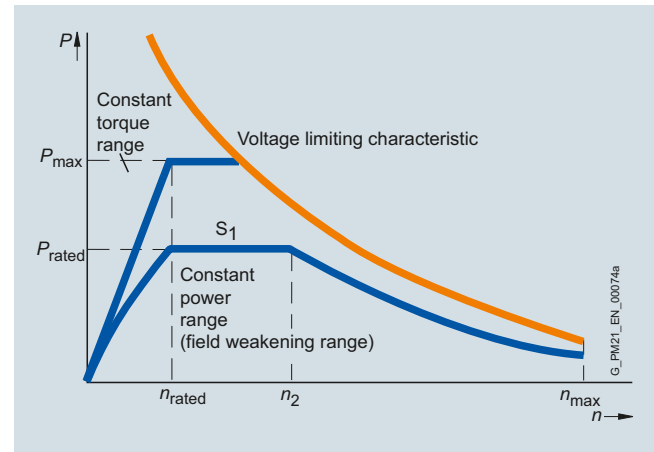
- Low space requirements thanks to high power density
- Performance capability thanks to wide rotational speed setting ranges
- High degree of structural flexibility due to the choice of
  - Asynchronous or synchronous design
  - Forced ventilation or water cooling
  - Mechanical designs
- Minimized maintenance costs thanks to high bearing service lives
- Precise motion control thanks to high rotational accuracy, even at the lowest speeds
- Maximum thermal utilization over the complete speed range
- Quiet operation as a result of low sound pressure level
- Optimized for the SINAMICS S120 drive system

**Application**

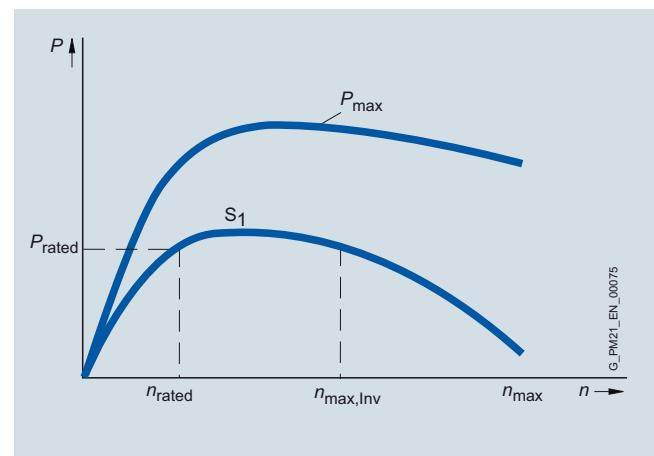
The application spectrum reaches across all industries and comprises, for example:

- Main drives in presses and extruders
- Converting applications
- Main spindle drives in machine tools  
(See Catalog NC 62)
- Rotary axes in the paper and printing industry
- Use in crane systems

The SIMOTICS M-1PH8 motors are suitable for installation in dry indoor areas without corrosive atmospheres.

**Characteristic curves****SIMOTICS M-1PH8 asynchronous motor**

Typical speed/power characteristic curve for SIMOTICS M-1PH8 asynchronous motors

**SIMOTICS M-1PH8 synchronous motor**

Typical speed/power characteristic curve for SIMOTICS M-1PH8 synchronous motors

The characteristic curves show the typical relationship between motor speed and drive power for SIMOTICS M-1PH8 motors for duty type S1 (continuous duty) in accordance with IEC 60034-1.

The detailed characteristic curves for the corresponding voltage and winding can be found in the SIMOTICS M-1PH8 Configuration Manual.

## SIMOTICS main motors

### SIMOTICS M asynchronous and synchronous motors for SINAMICS S120

#### SIMOTICS M-1PH8 asynchronous and synchronous motors, forced ventilation

##### Technical specifications

|                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SIMOTICS M-1PH8 motor, forced ventilation</b>                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Stator winding insulation in accordance with EN 60034-1 (IEC 60034-1)</b>                                                                                                                                                                                                                             | For an ambient temperature of up to 40 °C (104 °F)<br>Temperature class 180 (H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Cooling according to EN 60034-6 (IEC 60034-6)</b><br>• 1PH808 ... 1PH822<br>• 1PH828                                                                                                                                                                                                                  | Forced ventilation<br><br>Fan mounted axially at NDE<br>Fan mounted radially at NDE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Temperature monitoring</b>                                                                                                                                                                                                                                                                            | Pt1000 temperature sensor in the stator winding<br>1PH818 ... 1PH828 additional Pt1000 as reserve                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Fan supply voltage</b><br>• 1PH808<br>• 1PH810 ... 1PH816<br>• 1PH818/1PH822<br><br>• 1PH828                                                                                                                                                                                                          | 230 V 1 AC 50/60 Hz, 265 V 1 AC 60 Hz<br>400 V 3 AC 50/60 Hz, 480 V 3 AC 60 Hz<br>200 ... 277 V 1 AC 50/60 Hz (EC fan)<br>400 V 3 AC 50/60 Hz, 480 V 3 AC 60 Hz (optional)<br>400 V 3 AC 50/60 Hz, 480 V 3 AC 60 Hz                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Type of construction in accordance with EN 60034-7 (IEC 60034-7)</b><br>• 1PH808<br>• 1PH810 ... 1PH828                                                                                                                                                                                               | IM B3, IM B5<br>IM B3, IM B5, IM B35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Degree of protection in accordance with EN 60034-5 (IEC 60034-5)</b><br>• 1PH808 ... 1PH828<br>• 1PH818 ... 1PH828                                                                                                                                                                                    | IP55 (forced ventilation)<br>IP23 (open-circuit cooling)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Shaft extension on the drive end in accordance with DIN 748-3 (IEC 60034-5)</b>                                                                                                                                                                                                                       | Plain shaft or feather key full-key or half-key balancing for feather key                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Shaft and flange accuracy in accordance with DIN 42955 (IEC 60072-1) <sup>1)</sup></b>                                                                                                                                                                                                                | Without holding brake: Tolerance R (reduced)<br>With holding brake: Tolerance N (normal)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Vibration severity</b>                                                                                                                                                                                                                                                                                | In accordance with Siemens/EN 60034-14 (IEC 60034-14) <sup>1)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Sound pressure level <math>L_{pA}</math> (1 m) in accordance with DIN EN ISO 1680, max.</b><br>Tolerance +3 dB<br><u>Forced ventilation (IP55)</u><br>• 1PH808 ... 1PH813<br>• 1PH816<br>• 1PH818<br>• 1PH822<br>• 1PH828<br><br><u>Forced ventilation (IP23)</u><br>• 1PH818<br>• 1PH822<br>• 1PH828 | 70 dB at a rated pulse frequency of 4 kHz and a speed range up to 5000 rpm<br>73 dB at a rated pulse frequency of 4 kHz and a speed range up to 5000 rpm<br>73 dB at a rated pulse frequency of 2 kHz and a speed range up to 5000 rpm<br>73 dB at a rated pulse frequency of 2 kHz and a speed range up to 3500 rpm<br>74 dB at a rated pulse frequency of 2 kHz and a speed range up to 3300 rpm<br><br>73 dB at a rated pulse frequency of 2 kHz and a speed range up to 3000 rpm<br>73 dB at a rated pulse frequency of 2 kHz and a speed range up to 2000 rpm<br>74 dB at a rated pulse frequency of 2 kHz and a speed range up to 2800 rpm |
| <b>Built-in encoder systems</b>                                                                                                                                                                                                                                                                          | Absolute and incremental encoder with or without DRIVE-CLiQ interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Connection</b><br><u>Power</u><br>• 1PH808 ... 1PH813<br>• 1PH816 ... 1PH828<br><br><u>Fan</u><br>• 1PH808<br>• 1PH810 ... 1PH813<br>• 1PH816 ... 1PH828<br><br><u>Encoder system</u>                                                                                                                 | Connector for signals or DRIVE-CLiQ interface<br>(mating connector not included in the scope of supply)<br><br>Power connector or terminal box<br>Terminal box<br><br>Power connector<br>Power connector or terminal box<br>Terminal box<br><br>Connector for signals or DRIVE-CLiQ interface<br>(mating connector not included in the scope of supply)                                                                                                                                                                                                                                                                                          |
| <b>Rating plate</b>                                                                                                                                                                                                                                                                                      | 1 attached to motor<br>1 supplied separately with terminal box                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Paint finish</b>                                                                                                                                                                                                                                                                                      | Standard paint finish in anthracite RAL 7016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Certificate of suitability, according to</b>                                                                                                                                                                                                                                                          | cURus, CE, EAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

<sup>1)</sup> Shaft extension run-out, concentricity of centering ring and shaft, and perpendicularity of flange to shaft.

## Technical specifications (continued)

|                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SIMOTICS M-1PH8 motor, water cooling</b>                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Stator winding insulation in accordance with EN 60034-1 (IEC 60034-1)</b>                                                                                                             | For a coolant inlet temperature up to 30 °C (86 °F)<br>Temperature class 180 (H) <sup>2)</sup>                                                                                                                                                                                                                                                                                                               |
| <b>Cooling according to EN 60034-6 (IEC 60034-6)</b>                                                                                                                                     | Water cooling<br>Max. cooling water pressure at inlet: 6 bar<br>Connecting thread at NDE                                                                                                                                                                                                                                                                                                                     |
| <b>Temperature monitoring</b><br>• 1PH808 ... 1PH816<br>• 1PH818 ... 1PH828                                                                                                              | Pt1000 temperature sensor in the stator winding<br>1 additional Pt1000 as reserve                                                                                                                                                                                                                                                                                                                            |
| <b>Type of construction in accordance with EN 60034-7 (IEC 60034-7)</b><br>• 1PH808<br>• 1PH810 ... 1PH828                                                                               | IM B3, IM B5<br>IM B3, IM B5, IM B35                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Degree of protection in accordance with EN 60034-5 (IEC 60034-5)</b><br>• 1PH808 ... 1PH816<br>• 1PH818 ... 1PH828                                                                    | IP65<br>IP55                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Shaft extension on the drive end in accordance with DIN 748-3 (IEC 60072-1)</b>                                                                                                       | Plain shaft or feather key,<br>full-key or half-key balancing for feather key                                                                                                                                                                                                                                                                                                                                |
| <b>Shaft and flange accuracy in accordance with DIN 42955 (IEC 60072-1) <sup>1)</sup></b>                                                                                                | Without holding brake: Tolerance R (reduced)<br>With holding brake: Tolerance N (normal)                                                                                                                                                                                                                                                                                                                     |
| <b>Vibration severity</b>                                                                                                                                                                | in accordance with Siemens/EN 60034-14 (IEC 60034-14) <sup>1)</sup>                                                                                                                                                                                                                                                                                                                                          |
| <b>Sound pressure level <math>L_{pA}</math> (1 m) in accordance with DIN EN ISO 1680, max.</b><br>Tolerance +3 dB<br>• 1PH808 ... 1PH813<br>• 1PH816<br>• 1PH818<br>• 1PH822<br>• 1PH828 | 68 dB at a rated pulse frequency of 4 kHz and a speed range up to 5000 rpm<br>69 dB at a rated pulse frequency of 4 kHz and a speed range up to 5000 rpm<br>70 dB at a rated pulse frequency of 2 or 4 kHz and a speed range up to 5000 rpm<br>70 dB at a rated pulse frequency of 2 or 4 kHz and a speed range up to 4500 rpm<br>72 dB at a rated pulse frequency of 2 kHz and a speed range up to 3300 rpm |
| <b>Built-in encoder systems</b>                                                                                                                                                          | Absolute and incremental encoder with or without DRIVE-CLiQ interface                                                                                                                                                                                                                                                                                                                                        |
| <b>Connection</b><br><u>Power</u><br>• 1PH808 ... 1PH813<br>• 1PH816 ... 1PH828<br><br><u>Fan</u><br>• 1PH808<br>• 1PH810 ... 1PH813<br>• 1PH816 ... 1PH828<br><br><u>Encoder system</u> | Connector for signals or DRIVE-CLiQ interface<br>(mating connector not included in the scope of supply)<br><br>Power connector or terminal box<br>Terminal box<br><br>Power connector<br>Power connector or terminal box<br>Terminal box<br><br>Connector for signals or DRIVE-CLiQ interface<br>(mating connector not included in the scope of supply)                                                      |
| <b>Rating plate</b>                                                                                                                                                                      | 1 attached to motor<br>1 supplied separately with terminal box                                                                                                                                                                                                                                                                                                                                               |
| <b>Paint finish</b>                                                                                                                                                                      | Standard paint finish in anthracite RAL 7016                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Certificate of suitability</b>                                                                                                                                                        | cURus, CE, EAC                                                                                                                                                                                                                                                                                                                                                                                               |

<sup>1)</sup> Shaft extension run-out, concentricity of centering ring and shaft, and perpendicularity of flange to shaft.

<sup>2)</sup> The following motors are designed to conform to temperature class 155 (F):  
1PH8107-1.F2/1PH8107-1.M2  
1PH8138-2.F2/1PH8138-2.G2  
1PH8164/1PH8166/1PH8168

## SIMOTICS main motors

SIMOTICS M asynchronous and synchronous motors for SINAMICS S120

### SIMOTICS M-1PH8 asynchronous motors > Forced ventilation, IP55 degree of protection

#### Selection and ordering data

| Rated speed                                      | Shaft height | Rated power            | Rated torque                            | Rated current    | Rated voltage    | Rated frequency   | Operating speed during field weakening, max. <sup>1)</sup> | Speed, max. <sup>2)</sup> | SIMOTICS M-1PH8 asynchronous motors<br>Forced ventilation<br><br>Article No. |
|--------------------------------------------------|--------------|------------------------|-----------------------------------------|------------------|------------------|-------------------|------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------|
| $n_{rated}$<br>rpm                               | SH           | $P_{rated}$<br>kW (hp) | $M_{rated}$<br>Nm (lb <sub>F</sub> -ft) | $I_{rated}$<br>A | $U_{rated}$<br>V | $f_{rated}$<br>Hz | $n_2$<br>rpm                                               | $n_{max}$<br>rpm          |                                                                              |
| Line voltage 400 V 3 AC, Smart/Basic Line Module |              |                        |                                         |                  |                  |                   |                                                            |                           |                                                                              |
| 400                                              | 100          | 2.5 (3.35)             | 60 (44.3)                               | 8.8              | 290              | 15.5              | 1500                                                       | 7000                      | 1PH8107-■ ■ B ■ ■ -....                                                      |
|                                                  | 132          | 2.9 (3.89)             | 69 (50.9)                               | 9                | 272              | 14.7              | 1500                                                       | 6000                      | 1PH8131-■ ■ B ■ ■ -....                                                      |
|                                                  |              | 5.2 (6.97)             | 124 (91.5)                              | 15.5             | 309              | 15.0              | 1000                                                       | 6000                      | 1PH8133-■ ■ B ■ ■ -....                                                      |
|                                                  |              | 6.4 (8.58)             | 153 (113)                               | 18               | 320              | 15.2              | 1000                                                       | 6000                      | 1PH8135-■ ■ B ■ ■ -....                                                      |
|                                                  |              | 6.9 (9.25)             | 165 (122)                               | 18               | 323              | 14.7              | 1300                                                       | 6000                      | 1PH8137-■ ■ B ■ ■ -....                                                      |
|                                                  | 160          | 9.5 (12.7)             | 227 (167)                               | 30               | 260              | 14.3              | 2150                                                       | 6500                      | 1PH8163-■ ■ B ■ ■ -....                                                      |
|                                                  |              | 13 (17.4)              | 310 (229)                               | 36               | 300              | 14.1              | 1750                                                       | 6500                      | 1PH8165-■ ■ B ■ ■ -....                                                      |
|                                                  | 180          | 16.3 (21.9)            | 389 (287)                               | 49               | 271              | 14.1              | 2800                                                       | 5000                      | 1PH8184-■ ■ B ■ ■ -....                                                      |
|                                                  |              | 21.2 (28.4)            | 506 (373)                               | 65               | 268              | 13.9              | 3000                                                       | 5000                      | 1PH8186-■ ■ B ■ ■ -....                                                      |
|                                                  | 225          | 30.4 (40.8)            | 726 (535)                               | 86               | 268              | 13.9              | 2400                                                       | 4500                      | 1PH8224-■ ■ B ■ ■ -....                                                      |
|                                                  |              | 39.2 (52.6)            | 936 (690)                               | 112              | 264              | 13.9              | 2500                                                       | 4500                      | 1PH8226-■ ■ B ■ ■ -....                                                      |
|                                                  |              | 48 (64.4)              | 1146 (845)                              | 132              | 272              | 13.8              | 2600                                                       | 4500                      | 1PH8228-■ ■ B ■ ■ -....                                                      |
|                                                  | 280          | 63 (84.5)              | 1504 (1109)                             | 154              | 325              | 13.6              | 1100                                                       | 3300                      | 1PH8284- 1 ■ B 1 ■ -....                                                     |
|                                                  |              | 80 (107)               | 1910 (1409)                             | 186              | 325              | 13.6              | 1200                                                       | 3300                      | 1PH8286- 1 ■ B 1 ■ -....                                                     |
|                                                  |              | 103 (138)              | 2459 (1814)                             | 245              | 325              | 13.6              | 1300                                                       | 3300                      | 1PH8288- 1 ■ B 1 ■ -....                                                     |
| 700                                              | 180          | 27 (36.2)              | 368 (271)                               | 65               | 320              | 24.0              | 3300                                                       | 5000                      | 1PH8184-■ ■ C ■ ■ -....                                                      |
|                                                  |              | 35 (46.9)              | 478 (353)                               | 83               | 330              | 23.9              | 3700                                                       | 5000                      | 1PH8186-■ ■ C ■ ■ -....                                                      |
|                                                  | 225          | 55 (73.8)              | 750 (553)                               | 136              | 310              | 23.8              | 2900                                                       | 4500                      | 1PH8224-■ ■ C ■ ■ -....                                                      |
|                                                  |              | 68 (91.2)              | 928 (684)                               | 162              | 310              | 23.8              | 3100                                                       | 4500                      | 1PH8226-■ ■ C ■ ■ -....                                                      |
|                                                  |              | 82 (110)               | 1119 (825)                              | 188              | 315              | 23.8              | 3300                                                       | 4500                      | 1PH8228-■ ■ C ■ ■ -....                                                      |
|                                                  | 280          | 110 (148)              | 1501 (1107)                             | 240              | 330              | 23.7              | 2100                                                       | 3300                      | 1PH8284- 1 ■ C 1 ■ -....                                                     |
|                                                  |              | 138 (185)              | 1883 (1389)                             | 295              | 325              | 23.7              | 2100                                                       | 3300                      | 1PH8286- 1 ■ C 1 ■ -....                                                     |
|                                                  |              | 166 (223)              | 2265 (1671)                             | 365              | 325              | 23.6              | 2100                                                       | 3300                      | 1PH8288- 1 ■ C 1 ■ -....                                                     |
| 1000                                             | 100          | 3.7 (4.96)             | 35 (25.8)                               | 10               | 333              | 35.8              | 2550                                                       | 9000                      | 1PH8103-■ ■ D ■ ■ -....                                                      |
|                                                  |              | 6.3 (8.45)             | 60 (44.3)                               | 17.5             | 307              | 35.5              | 4300                                                       | 9000                      | 1PH8107-■ ■ D ■ ■ -....                                                      |
|                                                  | 132          | 7.9 (10.6)             | 75 (55.3)                               | 20               | 316              | 34.8              | 3000                                                       | 8000                      | 1PH8131-■ ■ D ■ ■ -....                                                      |
|                                                  |              | 12 (16.1)              | 115 (84.8)                              | 30               | 319              | 35.0              | 3000                                                       | 8000                      | 1PH8133-■ ■ D ■ ■ -....                                                      |
|                                                  |              | 17 (22.8)              | 162 (119)                               | 43               | 307              | 34.8              | 4300                                                       | 8000                      | 1PH8137-■ ■ D ■ ■ -....                                                      |
|                                                  | 160          | 22 (29.5)              | 210 (155)                               | 55               | 300              | 34.2              | 2800                                                       | 6500                      | 1PH8163-■ ■ D ■ ■ -....                                                      |
|                                                  |              | 28 (37.5)              | 267 (197)                               | 71               | 292              | 34.2              | 4600                                                       | 6500                      | 1PH8165-■ ■ D ■ ■ -....                                                      |
|                                                  | 180          | 39 (52.3)              | 372 (274)                               | 87               | 340              | 34.0              | 4200                                                       | 5000                      | 1PH8184-■ ■ D ■ ■ -....                                                      |
|                                                  |              | 51 (68.4)              | 487 (359)                               | 112              | 340              | 34.0              | 4400                                                       | 5000                      | 1PH8186-■ ■ D ■ ■ -....                                                      |
|                                                  | 225          | 71 (95.2)              | 678 (500)                               | 158              | 335              | 33.8              | 3300                                                       | 4500                      | 1PH8224-■ ■ D ■ ■ -....                                                      |
|                                                  |              | 92 (123)               | 879 (648)                               | 194              | 340              | 33.8              | 3300                                                       | 4500                      | 1PH8226-■ ■ D ■ ■ -....                                                      |
|                                                  |              | 113 (152)              | 1079 (796)                              | 235              | 340              | 33.9              | 3300                                                       | 4500                      | 1PH8228-■ ■ D ■ ■ -....                                                      |
|                                                  | 280          | 150 (201)              | 1433 (1057)                             | 315              | 335              | 33.7              | 2100                                                       | 3300                      | 1PH8284- 1 ■ D 1 ■ -....                                                     |
|                                                  |              | 182 (244)              | 1738 (1282)                             | 410              | 330              | 33.6              | 2100                                                       | 3300                      | 1PH8286- 1 ■ D 1 ■ -....                                                     |
|                                                  |              | 226 (303)              | 2158 (1592)                             | 495              | 335              | 33.6              | 2100                                                       | 3300                      | 1PH8288- 1 ■ D 1 ■ -....                                                     |

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## SIMOTICS main motors

SIMOTICS M asynchronous and synchronous motors for SINAMICS S120

### SIMOTICS M-1PH8 asynchronous motors > Forced ventilation, IP55 degree of protection

#### Selection and ordering data

| Rated speed                                 | Shaft height | Rated power            | Rated torque                            | Rated current    | Rated voltage    | Rated frequency   | Operating speed during field weakening, max. <sup>1)</sup> | Speed, max. <sup>2)</sup> | SIMOTICS M-1PH8 asynchronous motors<br>Forced ventilation<br><br>Article No. |
|---------------------------------------------|--------------|------------------------|-----------------------------------------|------------------|------------------|-------------------|------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------|
| $n_{rated}$<br>rpm                          | SH           | $P_{rated}$<br>kW (hp) | $M_{rated}$<br>Nm (lb <sub>r</sub> -ft) | $I_{rated}$<br>A | $U_{rated}$<br>V | $f_{rated}$<br>Hz | $n_2$<br>rpm                                               | $n_{max}$<br>rpm          |                                                                              |
| Line voltage 400 V 3 AC, Active Line Module |              |                        |                                         |                  |                  |                   |                                                            |                           |                                                                              |
| 500                                         | 100          | 3.2 (4.29)             | 61 (45.0)                               | 8.8              | 345              | 18.8              | 1500                                                       | 7000                      | 1PH8107-■ ■ B ■ ■ -....                                                      |
|                                             | 132          | 3.6 (4.83)             | 69 (50.9)                               | 9                | 328              | 18.0              | 1500                                                       | 6000                      | 1PH8131-■ ■ B ■ ■ -....                                                      |
|                                             |              | 6.5 (8.72)             | 124 (91.5)                              | 15.5             | 363              | 18.5              | 1200                                                       | 6000                      | 1PH8133-■ ■ B ■ ■ -....                                                      |
|                                             |              | 8 (10.7)               | 153 (113)                               | 18               | 380              | 18.5              | 1000                                                       | 6000                      | 1PH8135-■ ■ B ■ ■ -....                                                      |
|                                             |              | 8.6 (11.5)             | 165 (122)                               | 18               | 391              | 17.8              | 1400                                                       | 6000                      | 1PH8137-■ ■ B ■ ■ -....                                                      |
|                                             |              | 12 (16.1)              | 229 (169)                               | 30               | 325              | 17.6              | 2200                                                       | 6500                      | 1PH8163-■ ■ B ■ ■ -....                                                      |
|                                             | 160          | 16 (21.5)              | 306 (226)                               | 36               | 365              | 17.5              | 1850                                                       | 6500                      | 1PH8165-■ ■ B ■ ■ -....                                                      |
|                                             |              | 20.5 (27.5)            | 392 (289)                               | 49               | 335              | 17.4              | 2900                                                       | 5000                      | 1PH8184-■ ■ B ■ ■ -....                                                      |
|                                             | 180          | 26.5 (35.5)            | 506 (373)                               | 65               | 335              | 17.2              | 3100                                                       | 5000                      | 1PH8186-■ ■ B ■ ■ -....                                                      |
|                                             |              | 38 (51.0)              | 726 (535)                               | 85               | 335              | 17.2              | 2500                                                       | 4500                      | 1PH8224-■ ■ B ■ ■ -....                                                      |
|                                             | 225          | 49 (65.7)              | 936 (690)                               | 110              | 330              | 17.2              | 2600                                                       | 4500                      | 1PH8226-■ ■ B ■ ■ -....                                                      |
|                                             |              | 60 (80.5)              | 1146 (845)                              | 132              | 340              | 17.2              | 2700                                                       | 4500                      | 1PH8228-■ ■ B ■ ■ -....                                                      |
|                                             |              | 80 (107)               | 1529 (1128)                             | 154              | 395              | 17.0              | 1600                                                       | 3300                      | 1PH8284- 1 ■ B 1 ■ -....                                                     |
|                                             | 280          | 100 (134)              | 1909 (1408)                             | 188              | 400              | 17.0              | 1600                                                       | 3300                      | 1PH8286- 1 ■ B 1 ■ -....                                                     |
|                                             |              | 130 (174)              | 2481 (1830)                             | 245              | 395              | 17.0              | 1600                                                       | 3300                      | 1PH8288- 1 ■ B 1 ■ -....                                                     |
| 800                                         |              | 180                    | 31 (41.6)                               | 370 (273)        | 65               | 365               | 27.4                                                       | 3800                      | 5000                                                                         |
|                                             | 40 (53.6)    | 478 (353)              | 83                                      | 360              | 27.3             | 4100              | 5000                                                       | 1PH8186-■ ■ C ■ ■ -....   |                                                                              |
|                                             |              | 225                    | 57 (76.4)                               | 681 (502)        | 126              | 350               | 27.1                                                       | 3400                      | 4500                                                                         |
|                                             | 73 (97.9)    | 872 (643)              | 154                                     | 350              | 27.1             | 3600              | 4500                                                       | 1PH8226-■ ■ C ■ ■ -....   |                                                                              |
|                                             |              | 92 (123)               | 1098 (810)                              | 182              | 360              | 27.2              | 3800                                                       | 4500                      | 1PH8228-■ ■ C ■ ■ -....                                                      |
|                                             |              | 280                    | 125 (168)                               | 1492 (1100)      | 235              | 400               | 27.0                                                       | 2300                      | 3300                                                                         |
|                                             | 155 (208)    | 1850 (1364)            | 285                                     | 385              | 27.0             | 2300              | 3300                                                       | 1PH8286- 1 ■ C 1 ■ -....  |                                                                              |
|                                             | 190 (255)    | 2268 (1673)            | 365                                     | 370              | 27.0             | 2300              | 3300                                                       | 1PH8288- 1 ■ C 1 ■ -....  |                                                                              |
| 1150                                        | 100          | 4.3 (5.77)             | 36 (26.6)                               | 10               | 380              | 40.7              | 2450                                                       | 9000                      | 1PH8103-■ ■ D ■ ■ -....                                                      |
|                                             | 7.2 (9.66)   | 60 (44.3)              | 17.5                                    | 348              | 40.6             | 4750              | 9000                                                       | 1PH8107-■ ■ D ■ ■ -....   |                                                                              |
|                                             |              | 132                    | 9 (12.1)                                | 75 (55.3)        | 20               | 360               | 39.8                                                       | 3000                      | 8000                                                                         |
|                                             | 13.5 (18.1)  | 112 (82.6)             | 29                                      | 361              | 40.0             | 3000              | 8000                                                       | 1PH8133-■ ■ D ■ ■ -....   |                                                                              |
|                                             |              | 19.5 (26.1)            | 162 (119)                               | 43               | 350              | 39.8              | 4000                                                       | 8000                      | 1PH8137-■ ■ D ■ ■ -....                                                      |
|                                             |              | 160                    | 25 (33.5)                               | 208 (153)        | 55               | 343               | 39.2                                                       | 3550                      | 6500                                                                         |
|                                             | 208 (279)    | 257 (190)              | 69                                      | 333              | 39.2             | 4850              | 6500                                                       | 1PH8165-■ ■ D ■ ■ -....   |                                                                              |
|                                             |              | 180                    | 44 (59.0)                               | 365 (269)        | 86               | 390               | 39.0                                                       | 4800                      | 5000                                                                         |
|                                             | 58 (77.8)    | 482 (356)              | 112                                     | 390              | 38.9             | 5000              | 5000                                                       | 1PH8186-■ ■ D ■ ■ -....   |                                                                              |
|                                             |              | 225                    | 81 (109)                                | 673 (496)        | 156              | 385               | 38.8                                                       | 3400                      | 4500                                                                         |
|                                             | 105 (141)    | 872 (643)              | 192                                     | 390              | 38.8             | 3400              | 4500                                                       | 1PH8226-■ ■ D ■ ■ -....   |                                                                              |
|                                             |              | 129 (173)              | 1071 (790)                              | 235              | 390              | 38.8              | 3400                                                       | 4500                      | 1PH8228-■ ■ D ■ ■ -....                                                      |
|                                             |              | 280                    | 170 (228)                               | 1414 (1043)      | 310              | 400               | 38.6                                                       | 2200                      | 3300                                                                         |
|                                             | 210 (282)    | 1745 (1287)            | 410                                     | 380              | 38.6             | 2200              | 3300                                                       | 1PH8286- 1 ■ D 1 ■ -....  |                                                                              |
|                                             |              | 260 (349)              | 2160 (1593)                             | 495              | 385              | 38.6              | 2200                                                       | 3300                      | 1PH8288- 1 ■ D 1 ■ -....                                                     |

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For footnotes, see next page.

## SIMOTICS main motors

SIMOTICS M asynchronous and synchronous motors for SINAMICS S120

### SIMOTICS M-1PH8 asynchronous motors > Forced ventilation, IP55 degree of protection

#### Selection and ordering data

| Rated speed                                      | Shaft height | Rated power            | Rated torque                            | Rated current    | Rated voltage    | Rated frequency   | Operating speed during field weakening, max. <sup>1)</sup> | Speed, max. <sup>2)</sup> | SIMOTICS M-1PH8 asynchronous motors<br>Forced ventilation<br><br>Article No. |
|--------------------------------------------------|--------------|------------------------|-----------------------------------------|------------------|------------------|-------------------|------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------|
| $n_{rated}$<br>rpm                               | SH           | $P_{rated}$<br>kW (hp) | $M_{rated}$<br>Nm (lb <sub>r</sub> -ft) | $I_{rated}$<br>A | $U_{rated}$<br>V | $f_{rated}$<br>Hz | $n_2$<br>rpm                                               | $n_{max}$<br>rpm          |                                                                              |
| Line voltage 480 V 3 AC, Smart/Basic Line Module |              |                        |                                         |                  |                  |                   |                                                            |                           |                                                                              |
| 600                                              | 100          | 3.8 (5.10)             | 60 (44.3)                               | 8.8              | 406              | 22.0              | 1500                                                       | 7000                      | 1PH8107-■B■-....                                                             |
|                                                  | 132          | 4.3 (5.77)             | 68 (50.2)                               | 9                | 384              | 21.3              | 1500                                                       | 6000                      | 1PH8131-■B■-....                                                             |
|                                                  |              | 7.8 (10.5)             | 124 (91.5)                              | 15.5             | 421              | 21.8              | 1200                                                       | 6000                      | 1PH8133-■B■-....                                                             |
|                                                  |              | 9.6 (12.9)             | 153 (113)                               | 18               | 443              | 21.9              | 1000                                                       | 6000                      | 1PH8135-■B■-....                                                             |
|                                                  |              | 10.3 (13.8)            | 165 (122)                               | 18               | 458              | 21.4              | 1300                                                       | 6000                      | 1PH8137-■B■-....                                                             |
|                                                  |              | 14.5 (19.4)            | 231 (170)                               | 30               | 370              | 21.0              | 2150                                                       | 6500                      | 1PH8163-■B■-....                                                             |
|                                                  | 160          | 19 (25.5)              | 302 (223)                               | 35               | 420              | 20.8              | 1800                                                       | 6500                      | 1PH8165-■B■-....                                                             |
|                                                  |              | 25 (33.5)              | 398 (294)                               | 49               | 410              | 20.7              | 3000                                                       | 5000                      | 1PH8184-■B■-....                                                             |
|                                                  | 180          | 32 (42.9)              | 509 (375)                               | 66               | 400              | 20.6              | 3200                                                       | 5000                      | 1PH8186-■B■-....                                                             |
|                                                  |              | 45 (60.3)              | 716 (528)                               | 83               | 405              | 20.5              | 2600                                                       | 4500                      | 1PH8224-■B■-....                                                             |
|                                                  | 225          | 59 (79.1)              | 939 (693)                               | 110              | 395              | 20.5              | 2700                                                       | 4500                      | 1PH8226-■B■-....                                                             |
|                                                  |              | 72 (96.6)              | 1146 (845)                              | 130              | 410              | 20.5              | 2800                                                       | 4500                      | 1PH8228-■B■-....                                                             |
|                                                  |              | 95 (127)               | 1519 (1120)                             | 154              | 460              | 20.3              | 1800                                                       | 3300                      | 1PH8284-1■B1■-....                                                           |
|                                                  | 280          | 120 (161)              | 1916 (1413)                             | 188              | 460              | 20.3              | 1800                                                       | 3300                      | 1PH8286-1■B1■-....                                                           |
|                                                  |              | 155 (208)              | 2474 (1825)                             | 245              | 460              | 20.3              | 1800                                                       | 3300                      | 1PH8288-1■B1■-....                                                           |
| 1000                                             |              | 180                    | 39 (52.3)                               | 372 (274)        | 65               | 460               | 34.0                                                       | 3700                      | 5000                                                                         |
|                                                  |              | 50 (67.1)              | 478 (353)                               | 83               | 450              | 33.9              | 4000                                                       | 5000                      | 1PH8186-■C■-....                                                             |
|                                                  |              | 71 (95.2)              | 678 (500)                               | 126              | 425              | 33.8              | 3700                                                       | 4500                      | 1PH8224-■C■-....                                                             |
|                                                  | 225          | 92 (123)               | 879 (648)                               | 156              | 440              | 33.8              | 3900                                                       | 4500                      | 1PH8226-■C■-....                                                             |
|                                                  |              | 115 (154)              | 1098 (810)                              | 182              | 450              | 33.8              | 4000                                                       | 4500                      | 1PH8228-■C■-....                                                             |
|                                                  |              | 150 (201)              | 1433 (1057)                             | 230              | 455              | 33.7              | 2300                                                       | 3300                      | 1PH8284-1■C1■-....                                                           |
|                                                  | 280          | 185 (248)              | 1767 (1303)                             | 280              | 460              | 33.7              | 2300                                                       | 3300                      | 1PH8286-1■C1■-....                                                           |
|                                                  |              | 230 (308)              | 2197 (1620)                             | 355              | 460              | 33.6              | 2300                                                       | 3300                      | 1PH8288-1■C1■-....                                                           |
| 1350                                             |              | 100                    | 4.7 (6.30)                              | 33 (24.3)        | 9.7              | 423               | 47.3                                                       | 3500                      | 9000                                                                         |
|                                                  |              | 8.0 (10.7)             | 57 (42.0)                               | 17               | 400              | 47.1              | 5045                                                       | 9000                      | 1PH8107-■D■-....                                                             |
|                                                  |              | 10.6 (14.2)            | 75 (55.3)                               | 20               | 416              | 46.5              | 3000                                                       | 8000                      | 1PH8131-■D■-....                                                             |
|                                                  | 132          | 15 (20.1)              | 106 (78.2)                              | 28               | 417              | 46.5              | 3500                                                       | 8000                      | 1PH8133-■D■-....                                                             |
|                                                  |              | 22 (29.5)              | 156 (115)                               | 42               | 404              | 46.4              | 4000                                                       | 8000                      | 1PH8137-■D■-....                                                             |
|                                                  |              | 28 (37.5)              | 198 (146)                               | 52               | 400              | 45.8              | 4000                                                       | 6500                      | 1PH8163-■D■-....                                                             |
|                                                  | 160          | 34 (45.6)              | 241 (178)                               | 66               | 387              | 45.8              | 5600                                                       | 6500                      | 1PH8165-■D■-....                                                             |
|                                                  |              | 50 (67.1)              | 354 (261)                               | 84               | 450              | 45.7              | 5000                                                       | 5000                      | 1PH8184-■D■-....                                                             |
|                                                  | 180          | 67 (39.8)              | 474 (350)                               | 112              | 450              | 45.6              | 5000                                                       | 5000                      | 1PH8186-■D■-....                                                             |
|                                                  |              | 92 (123)               | 651 (480)                               | 154              | 450              | 45.5              | 3400                                                       | 4500                      | 1PH8224-■D■-....                                                             |
|                                                  | 225          | 120 (161)              | 849 (626)                               | 188              | 460              | 45.5              | 3400                                                       | 4500                      | 1PH8226-■D■-....                                                             |
|                                                  |              | 147 (197)              | 1040 (767)                              | 225              | 460              | 45.5              | 3400                                                       | 4500                      | 1PH8228-■D■-....                                                             |
|                                                  |              | 200 (268)              | 1416 (1044)                             | 315              | 460              | 45.3              | 2200                                                       | 3300                      | 1PH8284-1■D1■-....                                                           |
|                                                  | 280          | 245 (329)              | 1733 (1278)                             | 410              | 445              | 45.3              | 2200                                                       | 3300                      | 1PH8286-1■D1■-....                                                           |
|                                                  |              | 305 (409)              | 2158 (1592)                             | 495              | 450              | 45.3              | 2200                                                       | 3300                      | 1PH8288-1■D1■-....                                                           |

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and options.

## SIMOTICS main motors

SIMOTICS M asynchronous and synchronous motors for SINAMICS S120

### SIMOTICS M-1PH8 asynchronous motors > Forced ventilation, IP55 degree of protection

#### Selection and ordering data

| Rated speed                                        | Shaft height | Rated power            | Rated torque                            | Rated current    | Rated voltage    | Rated frequency   | Operating speed during field weakening, max. <sup>1)</sup> | Speed, max. <sup>2)</sup> | SIMOTICS M-1PH8 asynchronous motors<br>Forced ventilation                                                                                                              |
|----------------------------------------------------|--------------|------------------------|-----------------------------------------|------------------|------------------|-------------------|------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $n_{rated}$<br>rpm                                 | SH           | $P_{rated}$<br>kW (hp) | $M_{rated}$<br>Nm (lb <sub>f</sub> -ft) | $I_{rated}$<br>A | $U_{rated}$<br>V | $f_{rated}$<br>Hz | $n_2$<br>rpm                                               | $n_{max}$<br>rpm          | Article No.                                                                                                                                                            |
| <b>Line voltage 480 V 3 AC, Active Line Module</b> |              |                        |                                         |                  |                  |                   |                                                            |                           |                                                                                                                                                                        |
| <b>700</b>                                         | 100          | 4.4 (5.90)             | 60 (44.3)                               | 8.7              | 452              | 25.5              | 1500                                                       | 7000                      | 1PH8107- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 4.9 (6.57)             | 67 (49.4)                               | 9                | 450              | 24.6              | 1500                                                       | 6000                      | 1PH8131- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 132          | 9.1 (12.2)             | 124 (91.5)                              | 15.5             | 480              | 25.2              | 1200                                                       | 6000                      | 1PH8133- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 11.2 (15.0)            | 153 (113)                               | 18               | 500              | 25.3              | 1000                                                       | 6000                      | 1PH8135- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 11.5 (15.4)            | 157 (116)                               | 17.5             | 500              | 24.9              | 1300                                                       | 6000                      | 1PH8137- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 16.9 (22.7)            | 231 (170)                               | 30               | 427              | 24.4              | 2250                                                       | 6500                      | 1PH8163- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 160          | 22 (29.5)              | 300 (221)                               | 35               | 475              | 24.3              | 1900                                                       | 6500                      | 1PH8165- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 29 (38.9)              | 396 (292)                               | 49               | 475              | 24.0              | 3100                                                       | 5000                      | 1PH8184- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 180          | 37 (49.6)              | 505 (372)                               | 65               | 470              | 23.9              | 3400                                                       | 5000                      | 1PH8186- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 52 (69.7)              | 709 (523)                               | 82               | 470              | 23.9              | 2700                                                       | 4500                      | 1PH8224- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 68 (91.2)              | 928 (684)                               | 108              | 465              | 23.8              | 2800                                                       | 4500                      | 1PH8226- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 280          | 84 (113)               | 1146 (845)                              | 130              | 480              | 23.8              | 2900                                                       | 4500                      | 1PH8228- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 105 (141)              | 1433 (1057)                             | 150              | 500              | 23.7              | 1400                                                       | 3300                      | 1PH8284- 1 <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -.... |
|                                                    |              | 132 (177)              | 1801 (1328)                             | 184              | 500              | 23.7              | 1500                                                       | 3300                      | 1PH8286- 1 <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -.... |
|                                                    |              | 165 (221)              | 2251 (1660)                             | 230              | 500              | 23.7              | 1600                                                       | 3300                      | 1PH8288- 1 <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -.... |
| <b>1100</b>                                        | 180          | 42 (56.3)              | 365 (269)                               | 64               | 500              | 37.3              | 3800                                                       | 5000                      | 1PH8184- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 55 (73.8)              | 478 (353)                               | 83               | 500              | 37.3              | 4100                                                       | 5000                      | 1PH8186- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 225          | 78 (105)               | 677 (499)                               | 126              | 470              | 37.1              | 3700                                                       | 4500                      | 1PH8224- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 101 (135)              | 877 (647)                               | 154              | 500              | 37.1              | 3900                                                       | 4500                      | 1PH8226- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 126 (169)              | 1094 (807)                              | 182              | 500              | 37.1              | 4000                                                       | 4500                      | 1PH8228- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 280          | 155 (208)              | 1346 (993)                              | 220              | 500              | 37.0              | 2400                                                       | 3300                      | 1PH8284- 1 <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -.... |
|                                                    |              | 191 (256)              | 1658 (1223)                             | 270              | 500              | 37.0              | 2400                                                       | 3300                      | 1PH8286- 1 <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -.... |
|                                                    |              | 238 (319)              | 2066 (1524)                             | 345              | 500              | 37.0              | 2400                                                       | 3300                      | 1PH8288- 1 <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -.... |
| <b>1500</b>                                        | 100          | 5.2 (6.97)             | 33 (24.3)                               | 9.7              | 470              | 52.2              | 3500                                                       | 9000                      | 1PH8103- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 8.8 (11.8)             | 56 (41.3)                               | 17.0             | 440              | 52.0              | 5750                                                       | 9000                      | 1PH8107- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 132          | 11.7 (15.7)            | 74 (54.6)                               | 20               | 460              | 51.5              | 3000                                                       | 8000                      | 1PH8131- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 16.6 (22.3)            | 106 (78.2)                              | 28               | 459              | 51.5              | 3500                                                       | 8000                      | 1PH8133- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 24 (32.2)              | 153 (113)                               | 41               | 447              | 51.5              | 4500                                                       | 8000                      | 1PH8137- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 160          | 31 (41.6)              | 197 (145)                               | 52               | 442              | 50.9              | 4000                                                       | 6500                      | 1PH8163- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 37.7 (50.6)            | 240 (177)                               | 65               | 430              | 50.8              | 5000                                                       | 6500                      | 1PH8165- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 180          | 53 (71.1)              | 337 (249)                               | 80               | 500              | 50.6              | 5000                                                       | 5000                      | 1PH8184- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 73 (97.9)              | 465 (343)                               | 110              | 500              | 50.6              | 5000                                                       | 5000                      | 1PH8186- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 225          | 92 (123)               | 586 (432)                               | 142              | 500              | 50.4              | 3600                                                       | 4500                      | 1PH8224- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 120 (161)              | 764 (563)                               | 174              | 500              | 50.4              | 3600                                                       | 4500                      | 1PH8226- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    |              | 147 (197)              | 936 (690)                               | 210              | 500              | 50.5              | 3600                                                       | 4500                      | 1PH8228- <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -....   |
|                                                    | 280          | 200 (268)              | 1273 (939)                              | 290              | 500              | 50.3              | 2200                                                       | 3300                      | 1PH8284- 1 <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -.... |
|                                                    |              | 245 (329)              | 1560 (1151)                             | 380              | 495              | 50.3              | 2200                                                       | 3300                      | 1PH8286- 1 <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -.... |
|                                                    |              | 305 (409)              | 1942 (1432)                             | 455              | 500              | 50.3              | 2200                                                       | 3300                      | 1PH8288- 1 <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> <span style="background-color: #c6e0b4;">■</span> -.... |

For versions, see  
Article No. supplements  
and options.

## SIMOTICS main motors

SIMOTICS M asynchronous and synchronous motors for SINAMICS S120

Article No. supplements for SIMOTICS M-1PH8 without holding brake > SH 180 to SH 280

### Selection and ordering data

| Data position of the Article No.                                                                                   |  |  |  |                                              |  |  |  | 1                                               | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |   |   |   |   |  |
|--------------------------------------------------------------------------------------------------------------------|--|--|--|----------------------------------------------|--|--|--|-------------------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|---|---|---|---|--|
| <b>Shaft height 180</b>                                                                                            |  |  |  |                                              |  |  |  | 1                                               | P | H | 8 | 1 | 8 | . | – | ■ | ■  | ■  | ■  | ■  | –  | ■  | ■  | ■ | . | – | Z |  |
| <b>Shaft height 225</b>                                                                                            |  |  |  |                                              |  |  |  | 1                                               | P | H | 8 | 2 | 2 | . | – | ■ | ■  | ■  | ■  | ■  | –  | ■  | ■  | ■ | . | – | Z |  |
| <b>Shaft height 280</b> (only asynchronous variant with water cooling)                                             |  |  |  |                                              |  |  |  | 1                                               | P | H | 8 | 2 | 8 | . | – | ■ | ■  | ■  | ■  | ■  | –  | ■  | ■  | ■ | . | – | Z |  |
| <b>Overall length</b> (cannot be selected, determined by the choice of rated power)                                |  |  |  |                                              |  |  |  | .                                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
| <b>Asynchronous version</b>                                                                                        |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   | 1 |    |    |    |    |    |    |    |   |   |   |   |  |
| <b>Synchronous version</b>                                                                                         |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   | 2 |    |    |    |    |    |    |    |   |   |   |   |  |
| <b>Encoder systems for motors <u>without</u> DRIVE-CLiQ interface</b>                                              |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
| Without encoder <sup>1)</sup>                                                                                      |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   | A  |    |    |    |    |    |    |   | 2 |   |   |  |
| Absolute encoder EnDat 2048 S/R (encoder AM2048S/R)                                                                |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   | E  |    |    |    |    |    |    |   | 2 |   |   |  |
| Incremental encoder HTL 1024 S/R (encoder HTL1024S/R) <sup>1)</sup>                                                |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   | H  |    |    |    |    |    |    |   | 2 |   |   |  |
| Incremental encoder HTL 2048 S/R (encoder HTL2048S/R) <sup>1) 4)</sup>                                             |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   | J  |    |    |    |    |    |    |   | 2 |   |   |  |
| Incremental encoder HTL 1024 S/R (encoder HTL1024S/R) with connection via additional terminal box <sup>1)</sup>    |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   | W  |    |    |    |    |    |    |   | 2 |   |   |  |
| Incremental encoder HTL 2048 S/R (encoder HTL2048S/R) with connection via additional terminal box <sup>1) 4)</sup> |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   | Y  |    |    |    |    |    |    |   | 2 |   |   |  |
| Incremental encoder sin/cos 1 V <sub>pp</sub> 2048 S/R with C and D track (encoder IC2048S/R)                      |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   | M  |    |    |    |    |    |    |   | 2 |   |   |  |
| <b>Encoder systems for motors <u>with</u> DRIVE-CLiQ interface</b>                                                 |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
| Absolute encoder 22-bit singleturn + 12-bit multiturn (encoder AM22DQ)                                             |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   | F  |    |    |    |    |    |    |   | 1 |   |   |  |
| Incremental encoder 22-bit with commutation position (encoder IC22DQ)                                              |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   | D  |    |    |    |    |    |    |   |   | 1 |   |  |
| <b>Rated speeds (380 V to 480 V 3 AC)</b> (winding design)                                                         |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
| 400 rpm, 500 rpm, 600 rpm, 700 rpm                                                                                 |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    | B  |    |    |    |    |    |   |   |   |   |  |
| 700 rpm, 800 rpm, 1000 rpm, 1100 rpm                                                                               |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    | C  |    |    |    |    |    |   |   |   |   |  |
| 1000 rpm, 1150 rpm, 1350 rpm, 1500 rpm                                                                             |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    | D  |    |    |    |    |    |   |   |   |   |  |
| 1500 rpm, 1750 rpm, 2000 rpm, 2200 rpm                                                                             |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    | F  |    |    |    |    |    |   |   |   |   |  |
| 2500 rpm, 2900 rpm, 3400 rpm                                                                                       |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    | L  |    |    |    |    |    |   |   |   |   |  |
| <b>Rated speeds (690 V 3 AC) only with shaft height 280</b> (winding design)                                       |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
| 400 rpm, 500 rpm                                                                                                   |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    | H  |    |    |    |    |    |   |   |   |   |  |
| 700 rpm, 800 rpm                                                                                                   |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    | K  |    |    |    |    |    |   |   |   |   |  |
| 1000 rpm, 1150 rpm                                                                                                 |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    | U  |    |    |    |    |    |   |   |   |   |  |
| 1500 rpm, 1750 rpm                                                                                                 |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    | W  |    |    |    |    |    |   |   |   |   |  |
| <b>Cooling</b>                                                                                                     |  |  |  |                                              |  |  |  | <b>Degree of protection</b>                     |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
| Forced ventilation, DE → NDE                                                                                       |  |  |  |                                              |  |  |  | IP55                                            |   |   |   |   |   |   |   |   |    |    |    |    |    | 0  |    |   |   |   |   |  |
| Forced ventilation, NDE → DE                                                                                       |  |  |  |                                              |  |  |  | IP55                                            |   |   |   |   |   |   |   |   |    |    |    |    |    | 1  |    |   |   |   |   |  |
| Water cooling                                                                                                      |  |  |  |                                              |  |  |  | IP55                                            |   |   |   |   |   |   |   |   |    |    |    |    |    | 2  |    |   |   |   |   |  |
| Forced ventilation, DE → NDE (only asynchronous version)                                                           |  |  |  |                                              |  |  |  | IP23                                            |   |   |   |   |   |   |   |   |    |    |    |    |    | 3  |    |   |   |   |   |  |
| Forced ventilation, NDE → DE (only asynchronous version)                                                           |  |  |  |                                              |  |  |  | IP23                                            |   |   |   |   |   |   |   |   |    |    |    |    |    | 4  |    |   |   |   |   |  |
| <b>Type of construction</b>                                                                                        |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
| <u>Shaft height 180</u>                                                                                            |  |  |  | <u>Shaft height 225</u>                      |  |  |  | <u>Shaft height 280</u>                         |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
| IM B3 (IM B6, IM B7, IM B8, IM V6)                                                                                 |  |  |  | IM B3 (IM B6, IM B7, IM B8, IM V6)           |  |  |  | IM B3 (IM V6)                                   |   |   |   |   |   |   |   |   |    |    |    | 0  |    |    |    |   |   |   |   |  |
| IM V5                                                                                                              |  |  |  | IM V5                                        |  |  |  | IM V5 <sup>9)</sup>                             |   |   |   |   |   |   |   |   |    |    |    | 1  |    |    |    |   |   |   |   |  |
| IM B5 with A450 flange (IM V3) <sup>5)</sup>                                                                       |  |  |  | IM B5 with A550 flange (IM V3) <sup>6)</sup> |  |  |  | IM B5 with A660 flange (IM V3) <sup>7) 9)</sup> |   |   |   |   |   |   |   |   |    |    |    | 2  |    |    |    |   |   |   |   |  |
| IM B35 with A450 flange (IM V35)                                                                                   |  |  |  | IM B35 with A550 flange (IM V35)             |  |  |  | IM B35 with A660 flange (IM V35)                |   |   |   |   |   |   |   |   |    |    |    | 3  |    |    |    |   |   |   |   |  |
| IM V15 with A450 flange                                                                                            |  |  |  | IM V15 with A550 flange                      |  |  |  | IM V15 with flange A660 <sup>9)</sup>           |   |   |   |   |   |   |   |   |    |    |    | 5  |    |    |    |   |   |   |   |  |
| <b>Version status</b> <sup>10)</sup>                                                                               |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
| <b>Special version</b> (order codes required for options)                                                          |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |  |
|                                                                                                                    |  |  |  |                                              |  |  |  |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   | Z |   |  |

For the 13th to 16th digit of the Article No., see next page.

**SIMOTICS main motors**

SIMOTICS M asynchronous and synchronous motors for SINAMICS S120

Article No. supplements for SIMOTICS M-1PH8 without holding brake > SH 180 to SH 280**Selection and ordering data** (continued)

| Data position of the Article No.                          |                                                       | 1                                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |   |   |   |   |
|-----------------------------------------------------------|-------------------------------------------------------|----------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|---|---|---|---|
|                                                           |                                                       | 1                                | P | H | 8 | . | . | . | - | ■ | ■  | ■  | ■  | ■  | -  | ■  | ■  | ■ | . | - | Z |
| <b>Shaft extension (DE)</b>                               |                                                       | <b>Balancing</b>                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |
| Plain shaft                                               | –                                                     |                                  |   |   |   |   |   |   |   |   |    |    |    |    | 0  |    |    |   |   |   |   |
| Feather key                                               | Full-key                                              |                                  |   |   |   |   |   |   |   |   |    |    |    |    | 1  |    |    |   |   |   |   |
| Feather key                                               | Half-key                                              |                                  |   |   |   |   |   |   |   |   |    |    |    |    | 2  |    |    |   |   |   |   |
| <b>Bearing</b>                                            | <b>Vibration severity acc. to Siemens/EN 60034-14</b> | <b>Shaft and flange accuracy</b> |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |
| Standard                                                  | A                                                     | N                                |   |   |   |   |   |   |   |   |    |    |    |    | A  |    |    |   |   |   |   |
| Standard                                                  | R/A                                                   | R                                |   |   |   |   |   |   |   |   |    |    |    |    | B  |    |    |   |   |   |   |
| Increased radial forces                                   | A                                                     | N                                |   |   |   |   |   |   |   |   |    |    |    |    | E  |    |    |   |   |   |   |
| Increased radial forces                                   | R/A                                                   | R                                |   |   |   |   |   |   |   |   |    |    |    |    | F  |    |    |   |   |   |   |
| <u>Also possible with shaft heights 180 and 225:</u>      |                                                       |                                  |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |
| Standard                                                  | S/A                                                   | R                                |   |   |   |   |   |   |   |   |    |    |    |    | C  |    |    |   |   |   |   |
| Standard <sup>1)</sup>                                    | SR/A                                                  | R                                |   |   |   |   |   |   |   |   |    |    |    |    | D  |    |    |   |   |   |   |
| Performance <sup>8)</sup>                                 | SR/A                                                  | R                                |   |   |   |   |   |   |   |   |    |    |    |    | L  |    |    |   |   |   |   |
| <b>Power connection</b> (looking at DE)                   |                                                       |                                  |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |
| <u>Terminal box</u>                                       | <u>Cable entry</u>                                    | <u>Signal connection</u>         |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |
| Top                                                       | Right                                                 | DE                               |   |   |   |   |   |   |   |   |    |    |    |    | A  |    |    |   |   |   |   |
| Top                                                       | Left                                                  | DE                               |   |   |   |   |   |   |   |   |    |    |    |    | B  |    |    |   |   |   |   |
| Top                                                       | NDE                                                   | Right                            |   |   |   |   |   |   |   |   |    |    |    |    | C  |    |    |   |   |   |   |
| Top                                                       | DE                                                    | Right                            |   |   |   |   |   |   |   |   |    |    |    |    | D  |    |    |   |   |   |   |
| <b>Version status</b> <sup>10)</sup>                      |                                                       |                                  |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   |   |
| <b>Special version</b> (order codes required for options) |                                                       |                                  |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |   |   |   | Z |

<sup>1)</sup> Only possible when 8th data position is "1" (Asynchronous version).<sup>4)</sup> Limited to  $n_{\max} = 4600$  rpm.<sup>5)</sup> Limited to  $n_{\max} = 3000$  rpm, not possible when 14th data position is "L" (Performance).<sup>6)</sup> Limited to  $n_{\max} = 2500$  rpm, not possible when 14th data position is "L" (Performance).<sup>7)</sup> Limited to  $n_{\max} = 2000$  rpm.<sup>8)</sup> Only possible when 8th data position is "1" (Asynchronous version); not possible when 12th data position is "2" (IM B5) and 11th data position is "3" and "4" (Forced ventilation, IP23).Shaft height 180: limited to  $n_{\max} = 7500$  rpm;Shaft height 225: limited to  $n_{\max} = 6000$  rpm.<sup>9)</sup> Only possible when 14th data position is "A" or "B" (Standard bearing).<sup>10)</sup> Directly coupled to 9th data position.